

causes symptoms similar to those due to a cortical lesion in the corresponding situation, but without the symptoms of irritation. Large hæmorrhages usually spread into the centrum ovale from the corpus striatum. The vessels in the white substance are small and give only small hæmorrhages.

Dr. WM. OSLER said this case illustrates one of the conditions which in the pregnant woman may lead to hemiplegia or fatal hæmorrhage. True apoplexy occurs most frequently in association with Bright's disease, and may come on during, or even be mistaken for, a uræmic attack. A specimen very similar to the one here shown is in his collection of brains in the Museum of McGill College—massive intraventricular hæmorrhage. Rupture of a cerebral vessel during labor is, he believed, rare. A second more common event is embolism of one of the cerebral arteries during parturition. Aphasia is very often associated, and in a majority of the patients old mitral disease exists. In a limited number of cases a third condition is present—thrombosis of the cerebral vessels, due possibly to blood conditions which favor coagulation.

Stated Meeting, February 25, 1889.

THE PRESIDENT, S. WEIR MITCHELL, M.D., IN THE CHAIR.

Dr. S. SOLIS-COHEN read the notes of a case of

OBSTINATE SCIATICA CURED BY DEEP INJECTIONS OF
OSMIC ACID.

The method of treating sciatica by deep injections of a solution of osmic acid is so well known that the present case is reported only on account of its peculiar therapeutic history previous to the resort to the agent in question. Nearly every other medicinal and surgical means known had been tried faithfully, but without good result. The details of the case are given merely to show that osmic acid was really the curative agent.

George D., brakeman, æt. forty-five, was admitted to the Department of Clinical Medicine of the Philadelphia

Polyclinic, March 24, 1888. For twenty years the patient had had more or less pain in the lumbar region, of gradual development, attributed by him to the fall of a log upon his back while engaged in transport duty during the war. About thirteen months ago he began to feel pain in the right hip extending along the course of the sciatic nerve to the heel. The pain was constant with paroxysms of aggravation, very frequently preventing him from working or even standing erect. Sleep was continually disturbed. He had been under treatment first in the Department for Nervous Diseases, where the diagnosis of sciatica was made, and then in the Surgical Department, for about a year; having been subjected to the influence of a number of medicaments, including among many others, arsenic, potassium iodide, antipyrine, and antifebrin; injections of atropine, morphine, and theine; electrical treatment had been employed; and among surgical procedures, blistering, nerve-stretching by elevating the limb during ether anæsthesia, and, finally, nerve-stretching after incision and exposure. The latter operation was performed February 21, 1888. Immediately after the operation slight relief was experienced, although pain below the knee continued, and with the return of the power of motion in the limb, pain recurred as violent as ever; and had continued without intermission for about two weeks, except when the patient was under the influence of hypodermatic injections of morphine, without which he could not obtain sleep. He was then transferred to the general medical clinic. Salol being then under investigation, especially as to its analgesic properties, was prescribed tentatively in doses of about thirty to forty grains per diem. It gave relief, but not enough to warrant the hope of permanent good from its continued administration.

March 29.—An injection of ten minims of a one per cent. solution of osmic acid was made deeply into the thigh in the neighborhood of the point of emergence of the sciatic nerve, just above the cicatrix of the incision for nerve-stretching. On each of the two succeeding days, fifteen minims were injected. Improvement now began to

be manifested, although the pain continued to disturb sleep. Tri-weekly injections of twenty minims each were made during the next two weeks; a pill of morphine, belladonna, and quinine being given when necessary to produce sleep.

April 11.—The patient was improved sufficiently to sleep without the pill.

19th.—Improvement had steadily progressed, so that only a cane was used instead of crutches for walking. An injection of twenty minims was made higher in the buttock near the sciatic notch, pain being felt more especially at that point. Patient discharged from hospital.

May 17.—The patient returned, stating that he still had pain, coming on at twelve or one o'clock at night and lasting until morning. He was free from pain during the day, and could walk readily with the aid of a cane. An injection of thirty minims was made at the same point as previous injection.

January 1, 1889.—The patient being sent for, reports that after the last injection he was so sore that he could not sleep that night. The soreness gradually abated, and two weeks later he was able to sleep without interruption during the whole night. Since then he has had no pain of any account. There is some weakness of the leg below the knee, and some improvement in the movement of the foot, but not enough to interfere with locomotion with the aid of a cane. He considers himself well.

Dr. J. MADISON TAYLOR then called attention to

SOME POINTS IN THE TREATMENT OF SCIATIC NEURITIS.

MASSAGE AND INUNCTION WITH A GLASS ROD.

The remarks were mainly intended to call attention to a simple device which he has used with success in the treatment of sciatic neuritis.

Probably the best treatment for sciatica is absolute rest. This, coupled with the use of continued cold, with galvanism, the repeated use of the actual cautery, or blisters, usually does much good. But oftentimes more is needed,

in the shape of regulated exercise, passive exercise of the affected limb; in short, overstretching of the nerve by forced extension and flexion by a skilled manipulator, deep massage, and the like. These last seem often to do as much or more than the more radical measures, but require the services of an experienced assistant, which many cannot afford.

A year or two ago a patient, suffering from an obstinate form of syphilis, which resisted treatment at the best hands in this country, went abroad and got practically well in the hands of a clever physician in Germany, by the use of our ancient ally mercurial ointment, applied in a very novel and effective manner. This consisted of a glass rod, the size of a section of broom handle, two feet long, on which the ointment was smeared, and thence slowly and firmly rubbed into the skin. This combined the inunctions which could thus be made very thorough and systematic, with deep massage of the tissues. It certainly seemed to effect a more thorough introduction of the drug into the circulation, for the ointment was thus made to entirely disappear into the skin. The firm, slow pressure thus exerted must have an immensely stimulating effect on the muscles, nerve sheaths, etc., as well as on the absorbents, and is of itself an excellent tonic. This method he has not yet been able to test thoroughly in cases of syphilis, but he confidently recommends it as offering great possibilities of rapidly impressing the system with mercury.

Having a patient suffering from chronic sciatic neuritis, on whom the skill of several specialists had been wrought in vain, he determined to apply the same method of treatment. He used an ointment of mercury, belladonna, and iodine, applied on a glass rod, for fifteen minutes at a time. Very prompt relief from pain was felt. Later he resorted to the use of the rod without the ointment, and with apparently equally good results. In a short time, two or three weeks, his case was practically cured. Since then he has used this method in many cases, usually in the hands of the patient himself—a most convenient plan. Its use is followed by a marked sensation of warmth and comfort. In

one case, that of a gentleman who was obliged frequently to ride on horseback to his business out of town, the pain in both legs became intense at three or four o'clock in the morning, keeping him awake thereafter. Nothing so relieved this as ten minutes deep massage with the rod. In a month, pain which had resisted remedies for a year had gone.

Dr. CHARLES K. MILLS did not think he had exhausted all the remedies known to our art in the treatment of the case reported by Dr. Cohen; but he remembered that the patient was treated by various methods, medicinal and otherwise. This was one of several cases in which he employed hypodermic injections of theine. He believed that this patient received a large number of these injections. His success with this measure had been varying. In a few cases the patients had been benefited, but in the case reported to-night, and in others, the relief has been only temporary. The treatment of sciatica, like the treatment of chorea or rheumatism, is a subject about which we might talk for a long time simply enumerating the remedies that have been used. In his own practice he had a method of treating sciatica which, while it might not be scientific, was practical. He divided his cases into recent cases, old cases, and intermediate cases. Recent cases would commonly yield to such remedies as salicylate of sodium, oil of gaultheria, and analogous drugs, associating with this treatment the hypodermic injection of morphia and atropia, and sometimes of theine. For the old cases he used some very old remedies, and often with greater success than some of the newer remedies. He had used turpentine with success after the method first recommended by Thomas King Chambers. He also used Donovan's solution, in fair doses; also iodide of potassium and colchicum. In these cases he nearly always associated with the foregoing agents the use of cod-liver oil, massage, and electricity. On the whole, he got as good results from this treatment as from any other. He had also used the Adamkiewicz electrode, by means of which chloroform is applied externally and electrically. This treatment had proved successful in a few instances.

All, of course, had used counter-irritation. The use of the hot iron certainly acted better than any other form of counter-irritation. So far as osmic acid is concerned, he had had very little experience. He had used nerve-stretching by the method without cutting, and in a few cases by cutting, but never with any marked success.

The case reported to-night is valuable and interesting, but the report of a single brilliant success with a remedy like osmic acid in a case like this, does not carry the full force of conviction as to its great value. The disease had existed for a very long time, it is true, and it finally yielded apparently to this agent, not long after surgical and other procedures had been used.

Dr. JAMES HENDRIE LLOYD last year treated a case of sciatica which he cured in eight months, and he wished to refer especially to what seemed to do the most good. He first applied the hot iron very thoroughly; he burned four holes along the course of the sciatic nerve. This afforded some relief, but did not cure the case. The man was sick for at least six months after this application. During this time he employed the usual remedies, salicylate of sodium in large doses, antipyrine, etc. He packed the leg in flowers of sulphur for a time without benefit. He then had an exacerbatation of the pain and had to employ large doses of morphia hypodermically. The injections were made deep into the muscles, but he must have used a syringe which was not aseptic, for abscesses formed. These were quite troublesome and burrowed through the muscles of the buttock, but the effect on the sciatica was very marked. Improvement began as soon as there was a free escape of pus. He supposed that this acted simply as another form of counter-irritant. He however did not recommend this as a method of treatment.

Speaking of one case not establishing a principle reminded him that in the first year of his practice he saw an obstinate case of sciatica in the person of his preceptor. After it had continued six months, the application of the hot iron in exactly the same manner as he employed it in the case referred to, was attended with brilliant success. From

the time that he came out of the ether he never had a recurrence of the pain, and for the remaining two or three years of his life he had no return of the trouble.

Last year he saw removed, at the Philadelphia Hospital, a sciatic nerve, which evidently had been the seat of a good deal of inflammation. He could not help thinking that the proper way to treat such a case would be to cut down with antiseptic precautions and open the sheath of the nerve. He believed that if we could be positive that the nerve is in that condition, that would be *the* method which would give the best results. This would be only following out the old-fashioned practice, obtained from the Chinese, of puncturing the sheath of the nerve with gold needles. He did not believe that the rubbing of ointments on the skin, separated from the nerve by thick layers of muscles, could influence the inflammatory action. He was sceptical in regard to all such remedies.

Dr. F. X. DERCUM said that there was one practical point of importance in regard to the use of the actual cautery, that is, that the burn should be superficial, not deep. We want to impress the nerve-endings, not to make holes, and to heal up the burns as rapidly as possible. After applying the hot iron, dress the burn antiseptically and allow it to heal. It is, he thinks, the *repeated* burnings that accomplish the good. His ordinary method in the treatment of sciatica is to first use the salicylates. If ordinary doses do not give a good result, then to give as large a dose as the patient can bear. The suggestion of Dr. Lloyd in regard to opening the sheath, he considered a valuable one. If there is inflammation, incision of the sheath would allow the effusion to escape. Even if it did not accomplish good in this way, it might so alter the nutrition of the nerve that benefit would ensue.

Dr. S. WEIR MITCHELL desired to make a few remarks upon this disease, which is so often quite easy to treat, and again so excessively difficult. It has a host of remedies. It had been his own fortune to see in hospital practice an enormous number of cases of sciatica, and he really thought he had done something toward improving the methods of

treatment in old and obstinate cases. It is probable that a large number of slighter cases are of rheumatic origin, but when this condition endures for a long time, or there is a primary traumatic cause, it is pretty sure to end in inflammation of the sheath, or of the nerve track, or of both, with more or less effusion within the sheath. Much of this opinion may seem to be mere guess-work, for the opportunities of seeing the living nerve are rare. He had, however, in two cases during the war, seen the nerve cut down upon for the relief of serious traumatic neuralgia. In both there was a considerable amount of serum within the nerve sheath. In one, as he remembered, the nerve itself was distinctly swollen and inflamed. In both these instances four or more inches of nerve were exposed, and in both cases the results of the operation were excellent.

In speaking of the treatment of sciatica, he desired to say that if the case has lasted long, or has not, and is serious or slight, of course he need hardly refer to the need of the most careful attention to the constitutional condition of the patient; nor need he go into the consideration of the anæmic, scorbutic, or gouty states, which require and reward prompt treatment by internal remedies. He might say, however, that if these matters having been duly considered, in ordinary instances of sciatica, massage alone is often competent to do the rest. What Dr. Taylor had said in this connection is of interest. This mode of treatment by massage is what the French call *effleurage*, and not deep kneading. A roller of glass would be a good instrument for making this form of impression on the nerves. It is simple, and anybody could be taught to use it.

In more severe cases the cautery is his favorite remedy. He was perfectly at one with Dr. Dercum in reference to the manner of using it. It should be used so as not to destroy the skin, which ought to be touched lightly three or four times in places along the track of the nerve. This may be repeated every three or four days until a cure is effected. Such burns scarcely require any dressing. In children, or in nervous people, the previous application of

ice, or of ice and salt, will prevent any immediate pain. But as regards this and all local means of treating this disorder he felt quite sure that they are most successful when the patient is kept at rest in bed.

As to nerve-stretching, he had had it done for sciatica three times, and he had seen three cases in which it had been done, so that his whole experience rests upon six cases. He thought he had never seen a case cured by this means. He did not say that it did not relieve for a time, for it did. But he might also add that in the last few years he had seen cases of this disease treated by nerve-stretching with failure of relief, and had afterwards seen them cured by means which might have been used first. Strong extension of the muscles, such as involves more or less stretching of the nerves, he thought was of great value in certain spastic spinal affections. But he had never had any luck with this treatment of sciatica.

He would like again and again to repeat that in severe cases rest is an imperative need. By this he did not mean merely remaining in bed, but the use of methods which may or may not be altogether his own (that is a matter of indifference), but which he had never seen elsewhere described, and which are now often used in the Infirmary by himself and his colleagues. These consist in placing the patient who has this neuralgia in bed and putting on him an old-fashioned thigh-fracture splint, insisting on its being worn night and day, so that it is impossible for him to bend his leg. The result of this absolute rest is, in many cases, quite remarkable. Nor does this means forbid the use of other agencies, notably the cautery, or low temperature, or of other measures which may be allowable.

Another measure which he did not know to have been used by any other one than himself is the *persistent* application of ice along the nerve track. This consists in applying ice-bags along the whole track of the main nerve *in connection with the splint*; that is to say, these bags are applied from the sciatic notch to below the knee. They are kept on day and night. In one case they were used as long as three weeks, with triumphant results.

He had made some investigations in regard to the temperature obtained by these applications, and at a later date he would make a report on this, considering it to be a subject worthy of further investigation. He had used bags filled with ice, and had had ice-water circulating through the bag. He had found that, by the use of different saline solutions with ice, it was possible to secure certain definite temperatures in the skin under the bags.

Dr. WHARTON SINKLER desired to call attention to one method which had not been spoken of. That is the method of acupuncture by the German apparatus called Baumscheidtmus, consisting of a number of needles which are driven into the skin in the course of the nerve and some counter-irritant oil rubbed in. He had cured one case of most obstinate and violent sciatica by this means, and the patient remained well for a number of years. In this case, however, it is possible that the result was influenced by the sloughing which occurred at the point of puncture. In another case, in which sloughing did not occur, a cure was also effected.

Dr. S. SOLIS-COHEN was aware that one case does not establish a general rule, and on that account simply reported this case without comment. Osmic acid, however, is not an untried remedy. There are very many cases of its use on record, principally during the last five or six years. He had used it in some twelve or fifteen cases, but only two were in private practice, and the notes in regard to the others are not at present accessible. His impression is that the result was satisfactory in about one-half of the cases. The German physician who first investigated this method reported upward of forty or fifty cases, and found that the results were best in the oldest cases. It was useless in the acute cases. Some experiments on animals were reported, showing that a definite alteration in the nerve cells, similar to that observed in histological preparations treated with the same agent, followed the injection of the remedy. It is probable that conduction is interfered with. He did not know how else we can explain the good result. He agreed with the speakers who consider internal

remedies, except where there is a constitutional or diathetic fault, as useless, except for palliation. Where the sciatica depends upon gout, or rheumatism, or anæmia, of course, salicylates, iron, arsenic, etc., as indicated, will often effect a cure, or greatly assist recovery. The value of iron specially needs emphasis, not only in anæmic but certain rheumatic conditions. Among remedies not mentioned, he had seen good results from the deep injection of chloroform. He had also occasionally seen temporary good results from the deep injection of atropine and morphine, in cases where the injection of morphine alone was without curative effect. The long list of agents and methods, each of which has been useful in some instances, shows there is no single treatment; but he believed that osmic acid, deeply injected near the seat of greatest pain, is among the remedies eminently worthy of consideration in unyielding cases such as that reported.

Dr. J. MADISON TAYLOR said that there is an anatomical point which he did not see credited with the influence which it deserves in determining the frequent occurrence of neuritis of the great sciatic near its exit from the notch. The nerve is very exposed just here, and it suffers direct compression by the action of several powerful muscles which run directly transverse to its course. The pyriformis alone acts as almost a constricting band in front, opposed by the obturator interni and Gemelli beneath. In whatsoever attitude the body assumes when any of these muscles are put in tension, there is strong compression exerted on these tender fibres. Hence, when inflammatory action occurs in the nerve or its sheath, it is brought to a focus here, the circulation is interfered with, and the smallest muscular movements cause pain and irritation. It is seldom granted us to use this organ in its earlier subacute or chronic condition of engorgement and thickening, but it is pretty certain we should find a red, swollen organ, with a jelly-like or sero-fibrinous exudate, crowding the sheath space, with here and there bloody extravasations. Now, next to the actual removal of this diseased section, as suggested by Dr. Lloyd, but not likely to be yet generally adopted, to his mind,

comes the gentle systematic compressing action by such means as he had suggested, which aids in breaking up old adhesions, and emptying out the engorged sheath, and such other results as aid a re-establishing of the normal elasticity of the parts. This massage does, but no hand can beat the power which this simple agent possesses, nor does the percutor of Mr. Mortimer Granville, so excellent in its results, do it any better, and not nearly so cheaply.

Dr. J. CHALMERS DA COSTA reported

FOUR CASES OF COCAINE DELIRIUM,

two of which occurred in his office practice, and two were observed in the surgical out-patient department of the Jefferson College Hospital, and the latter he is enabled to report by the courtesy of Dr. Horwitz, the department chief.

CASE I.—Man, twenty-five years of age, of nervous temperament, and addicted to the excessive use of alcohol. He had a stricture of the urethra, and had been for some time under treatment, but as the passage of instruments occasioned considerable pain, it was determined that cocaine should be employed.

He was handed a syringe containing M xxx. of a four per cent. solution, and told to throw it into the urethra. In a moment, on turning, he discovered him still seated on the edge of the sofa, one hand grasping the penis, the other the syringe, but pale and immobile as a statue; he spoke to him, but he made no answer, and when he touched him he fell over. He did not seem to breathe; the pulse at the wrist was imperceptible, the pupils were widely dilated, the lips were pale, the face pallid and bathed with sweat; there was muscular resolution, and complete unconsciousness. In about fifteen seconds breathing began, and the pulse reappeared. The pulse beat fifty to the minute, was small, and of high tension. The respirations were shallow and slow. The pupils were moderately dilated, and did not respond to light. Muscular resolution and unconsciousness were complete. Conjunctival reflex was abolished.

The extremities were icy-cold. There was entire insensibility to pain. The body was drenched with sweat. After several minutes, the face showed signs of venous congestion, the facial muscles twitched convulsively, the arms and legs were worked in a violent and irregular manner, and the patient tossed about on the sofa. The conjunctival reflex returned, but there was still analgesia. He soon began to talk incoherently, to laugh, shout, and sing, but paid no attention to words, or to being roughly shaken, and seemed entirely oblivious to his surroundings. He obviously had hallucinations of sight and hearing of an agreeable nature. The pulse was now rapid, weak, and irregular. The respiration shallow, frequent, and jerking.

This delirium gradually passed away; he would answer when spoken to, but could not maintain a thread of conversation, and when left to himself was concentrated on his own ideas, which flowed in a torrent, now grave, now gay, now majestic, now amusing. This condition was one of intellectual brilliancy. He quoted poetry, oratory, and philosophy (being a particularly well educated man, and a writer himself of some attainments). He gave portions of "Locksley Hall," with excellent effect, and wept as he recited Keat's "Ode to a Nightingale." When told that he had fainted while grasping his penis, and asked what would have been said by his friends had he died in that attitude, he responded, "The ruling passion is strong in death." He said he felt "gloriously happy," and that "a drowsy numbness filled his veins." Gradually he became quiet, and about one hour after the onset of the symptoms passed into an apparently natural sleep from which he awoke in two hours, feeling languid and somewhat giddy; complaining of headache and numbness of the extremities, dryness of the mouth, dimness of vision, and an intense desire to make water.

He remembered having begun to take the injection, but could recollect nothing more until he had reached the stage which he denominated a "poet's dream." In this stage, he says, his happiness was complete; he felt no care, took no note of time, experienced no surprise as to his situation,

and was occupied with poetic thoughts, dressed in splendid imagery.

He states that this mental condition was apparently identical with that occasioned in him by large experimental doses of hashish.

This gentleman, being of an experimental turn of mind, repeated the injection one night, with the result of alarming his family to a terrible extent. The family physician, who was sent for, expressed a strong and angry suspicion that alcohol was the whole trouble. The after-effects of this dose were decidedly unpleasant, and lasted many hours; being chiefly great prostration, numbness of the extremities, dry mouth, and dimness of vision.

CASE II.—Man, twenty years of age, brother of the preceding, of similar habits and temperament. Had been for some time under my care for urethral stricture. On his solicitation, \mathfrak{M} xv of a three per cent. solution of cocaine were injected into the urethra. Several bougies were passed without giving any pain. Some five minutes after the injection it was observed that his attention was withdrawn from the operation, and that he gave no answer when spoken to. The face was pale and covered with sweat, the pupils were moderately dilated, the pulse slow and of high tension, the respirations rapid, jerking, and irregular. Conjunctival reflex was not abolished, and on testing it he began to roll round, to toss his extremities, to shout and swear. He cried out that he could not breathe; he had hallucinations of sight, brushing bugs off his coat; and illusions of personality, thinking I was his brother.

He arose from the couch, staggered like a drunken man, and incoördinately adjusted his garments. His face was now flushed, and his pupils of normal size. He staggered about the office, upset chairs, aimed blows at me, and, with indistinct articulation, declared that I wanted to kill him. He insisted on going out, was with great difficulty got into a carriage, taken home, and put to bed, where he finally went to sleep, under sodii brom. and morphia. He awoke in the morning feeling as if he had been "on a tear," and

dimly remembering that he had abused me violently, for which he was very penitent. He remembered coming to my office, but had no memory of taking the injection, or of being operated upon.

CASE III.—Man, twenty-two years of age. Also a drinker. Came to the hospital to be operated upon for phimosis. 10 ℥ of a four per cent. solution of cocaine were thrown into the prepuce by means of a hypodermatic syringe. The operation was not entirely painless. About fifteen minutes after the injection he became very pale, and tetanically rigid, like a person in the first stage of an epileptic fit. The pupils were dilated, face was pale and covered with sweat, extremities cold, and he was unconscious. After a few seconds he tossed his arms, body, legs, and head, in a manner suggestive of the progressive movements of hystero-epilepsy. The pulse was rapid (120), weak and irregular. The respirations shallow and rapid. The reflexes were dulled, but not abolished. Sensibility was diminished, but not destroyed. He talked rapidly, inarticulately, and incoherently, prayed, swore, threatened, and tried to get up. In about twenty minutes he became quiet, was put to bed in the wards, and after some hours went home. Next day felt all right.

CASE IV.—Man, thirty years of age. Nervous temperament. Habits unknown. Came to the hospital for urethral stricture. Passage of instruments was productive of so much pain that 20 ℥ of a six per cent. solution of cocaine were injected into the urethra. In a few minutes he began to mutter, and to move his right hand as if sending a telegram (he was a telegraph operator). He began to talk about the message, saying it must be sent, and telegraphed with tremendous energy. His face was pale and moist, pupils of normal size and reacted to light, conjunctival and plantar reflexes present. Did not answer when spoken to, and did not feel a pin point. Respirations were rapid and shallow. Pulse was slow, and of considerable tension. This condition existed for some ten minutes, when he became conscious, and asked what was the matter. He complained of dyspnoea, and had no memory of events after the passage

of the first bougie. Next morning he stated that he felt dull and heavy for a number of hours after going home, that he found great difficulty in picking up small objects (pens, pencils, etc.), and that his fingers seemed numb, and could scarcely feel objects or grasp them.

Some physicians who have seen cases similar to these have stated their belief that the symptoms were purely the result of fright; but only one of these cases showed any apprehension.

It might be considered possible that such phenomena could ensue from a condition of reflex irritation, similar to the so-called pleuritic epilepsies which occasionally result from injecting the pleural cavity with iodine or some other agent. It seems improbable, however, that this was the condition here, as previous instrumentation on three of the cases induced no reflex disturbances and a repetition of the injection in one reproduced the symptoms.

He asked if the high arterial tension, the small and usually slow pulse, the pallor, the dilated pupils, and the unconsciousness are not evidences of cerebral anæmia from vaso-motor spasm. An interesting fact of this series of cases is the exhibition of a family idiosyncrasy by the occurrence of toxic symptoms in two brothers.

He inquired if the nervous temperament and the abuse of alcohol did not render the organism particularly susceptible to the action of cocaine, and if any signs exist which would indicate to us that cocaine would be dangerous in a given case.

Dr. FRANCIS X. DERCUM had repeatedly given cocaine in half-grain doses by subcutaneous injection without noticing any serious symptoms. This report is exceedingly interesting, and it is a question in his mind whether or not the locality in which the cocaine was applied had anything to do with the symptoms. The urethra is very sensitive and is intimately associated with the spinal centres. We must take this into consideration. It seemed to him that the case could hardly be considered proved unless a cross-experiment was made by injecting a similar dose of cocaine into the subcutaneous tissues of the patients whose interesting symptoms had just been detailed.

Dr. MITCHELL thought that the point in regard to the location of the injection was well taken. He knew by personal experience that different methods of taking a drug produce very different effects. When he himself takes morphia by the stomach, it produces horrible vomiting and headache, but when taken hypodermatically no inconvenience is produced; but this is common knowledge. What has been here told as to the occasional effects or the apparent effects of cocaine, when used by the urethra, should lead to some examination into the matter, since it is possible that there may be peculiarities due, in certain constitutions, to local impressions made on that sensitive tube by drugs.

Dr. LLOYD asked what is the proper dose of cocaine. He was using in one case two grains daily in divided doses, so far without any apparent effect.

Dr. E. N. BRUSH had had more or less experience with the injection of cocaine when it was first suggested for the treatment of certain forms of melancholia with stupor. He employed it in doses from one-half to one grain. The effect was to induce laughter in some, and a talkative state; it was only temporary and no serious symptoms were produced.

Personal experience had taught him that the effect of this drug on certain persons, even in good general health, is to render them more talkative. Last fall he used a four per cent. solution as a spray for a throat trouble, continuing the application but a few minutes. A talkative state was produced and in twenty minutes there was severe headache. He repeated the experiment on other occasions with the same result. He had had under his care a physician who, when he came to the hospital, was taking ten grains of cocaine daily. He had taken as much as thirty grains, he cut him down to two grains, then to one grain, and then stopped it altogether. There was no disturbance. He had had in all under his care three physicians who were addicted to the use of cocaine. Two used it hypodermatically and one by the mouth. The latter took forty grains a day, according to his own statement.

Dr. J. CHALMERS DACOSTA said that in hastily looking over the literature he found a very wide range or variation in reference to the dosage of cocaine. Martindale states in his book on coca and cocaine, that one man took without obvious ill-effect twenty-three grains. Another took, with suicidal intent, thirty-two grains, the result being considerable prostration. Dr. Dien, of Dantzic, an ophthalmologist, injected one-tenth of a grain under the conjunctiva and produced very alarming symptoms. The dangerous dose therefore seems to be somewhere between the wide extremes of one-tenth of a grain and thirty-two grains, but exactly where it is hard to tell.